

IN THE ABSTRACT

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ABSTRACT

A low-cost ceramic package, in land-grid array or ball-grid array configuration, for micromechanical components is fabricated by coating the whole integrated circuits wafer with a protective material, selectively etching the coating for solder ball attachment, singulating the chips, flip-chip assembling a chip onto the opening of a ceramic substrate, underfilling the gaps between the solder joints with a polymeric encapsulant, removing the protective material from the components, and attaching a lid to the substrate for sealing the package. It is an aspect of the present invention to be applicable to a variety of different semiconductor micromechanical devices, for instance actuators, motors, sensors, spatial light modulators, and deformable mirror devices. In all applications, the invention achieves technical advantages as well as significant cost reduction and yield increase.